BC hydro

Application for a
Certificate of Public Convenience and Necessity

Proposed Circuit 2L39 and 2L40 Underground Cable Replacement between Newell Substation and Hill Avenue Terminal Station

DOC
BC
B685
D:P6817A
2000
c.3

March 2000

THE POWER IS YOURS

BC hydro

LEGISLATIVE LIBRARY
VICTORIA, BC V8V 1X4

LEGISLATIVE LIBRARY OF BRITISH COLUMBIA
3 3298 00240 4086

Canadian Cataloguing in Publication Data
Main entry under title:
Proposed Circuit 2L39 and 2L40 Underground Cable Replacement between Newell Substation and Hill Avenue Terminal Station : application for a certificate of public convenience and necessity

Includes bibliographical references: p.
ISBN 0-7726-4152-8

1. Electric lines - British Columbia - Burnaby – Maintenance and repair. 2. Electric lines – British Columbia – Burnaby – Planning. 3. Electric power transmission - British Columbia – Burnaby - Planning. I. B.C. Hydro

TK3144.P76 2000 333.79'3214'0971133 C00-960065-5

100-04892/

BC hydro

Proposed Circuit 2L39 and 2L40 Underground Cable Replacement between Newell Substation and Hill Avenue Terminal Station

Application for a Certificate of Public Convenience and Necessity

March 2000

PROPOSED CIRCUIT 2L39 AND 2L40 UNDERGROUND CABLE REPLACEMENT BETWEEN NEWELL SUBSTATION AND HILL TERMINAL STATION APPLICATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

CONTENTS

Section	Subject	Page
	EXECUTIVE SUMMARY	1
	TRANSMISSION LINES REFERENCED	3
A	APPLICANT	A-1
	A.1 NAME, ADDRESS AND NATURE OF BUSINESS	A-1
	A.2 FINANCIAL AND TECHNICAL CAPACITY OF THE APPLICANT	A-1
	A.2.1 Financial Capacity	A-1
	A.2.2 Technical Capacity	A-1
	A.3 NAME, TITLE AND ADDRESS OF PERSONS TO CONTACT WITH RESPECT TO THIS APPLICATION	A-2
	A.4 NAME AND ADDRESS OF LEGAL COUNSEL	A-2
B	PROJECT DESCRIPTION	B-1
	B.1 DESCRIPTION OF THE PROJECT, ITS PURPOSE AND COST	B-1
	B.1.1 TECHNICAL DETAILS	B-1
	B.1.1.1 Existing System	B-1
	B.1.1.2 Description of the Hill Avenue Terminal Station Site	B-2
	B.1.1.3 Cable Replacement	B-2
	B 1.1.4 Substation and Terminal Station	B-3
	B.1.2 PURPOSE OF THE PROJECT	B-4
	B.1.3 PROJECT COST	B-4
	B.2 TIMETABLE	B-5
	B.3 PUBLIC WORKS	B-5
	B.4 IDENTIFICATION AND PRELIMINARY ASSESSMENT OF IMPACTS	B-5
	B.4.1 Social and Environmental Issues	B-5
	B.4.2 Proposed Mitigation Measures	B-6

CONTENTS (cont'd)

Section	Subject	Page
C	PROJECT JUSTIFICATION	C-1
D	PUBLIC CONSULTATION	D-1
E	OTHER APPLICATIONS AND APPROVALS	E-1
GLOSSARY		Glossary-1
REFERENCES		References-1

TABLES

Table No.	
A	Project Costs

FIGURES

Figure No.	
1	Metro 230 kV Network
2	B.C. Hydro Metro Division Electrical System
3	Load Forecast for South Burnaby, New Westminster and part of South Vancouver Area
4	Project Schedule

PROPOSED CIRCUIT 2L39 AND 2L40 UNDERGROUND CABLE REPLACEMENT BETWEEN NEWELL SUBSTATION AND HILL TERMINAL STATION

EXECUTIVE SUMMARY

B.C. Hydro submits this application, pursuant to Sections 45 and 46 of the Utilities Commission Act, and B.C. Utilities Commission Order G-133-99, for a Certificate of Public Convenience and Necessity. This application is for the replacement of the underground cable sections of Circuits 2L39 and 2L40 between Newell Substation and the Hill Avenue Terminal Station, located in Burnaby. The location of the project, known as the Circuit 2L39 and 2L40 Cable Replacement Project, is shown on Figure 1.

The purpose of this project is to replace the deteriorated 230 kV transmission cables of Circuits 2L39 and 2L40 to ensure the long-term reliable supply of electricity to B.C. Hydro's customers located in South Burnaby, New Westminster and part of South Vancouver. The installation of the new cables will also address the high annual maintenance cost of repairing the existing cables, the additional capacity requirements to meet future load growth, and potential environmental hazards due to oil leaks from the ageing cable. In general, the scope of the project consists of:

- Upgrading of the existing access road located within the B.C. Hydro right-of-way along the north side of the Trans Canada Highway, from Glencarin Drive to the Hill Avenue Terminal Station site.
- Removing the Hill Avenue Terminal Stations and replacing them with a single station located immediately east of the existing stations.
- Removing the cables and installing new higher capacity 230 kV transmission cables in the existing underground ductbank system, except for the crossing of the Trans Canada Highway, where new ducts will be installed by horizontal directional drilling.

The project is organized in two distinct stages. The first stage, which includes the construction of the new Hill Avenue Terminal Station, for both circuits, and the replacement of the Circuit 2L39 cables, is scheduled to be completed by Fall 2001. The second stage, which is scheduled in service by Fall 2002, would commence following the completion of Stage 1 and includes the replacement of the Circuit 2L40 cables.

The estimated cost of the project is $29.8 million, including inflation, corporate overhead and interest during construction.

This Application for a Certificate of Public Convenience and Necessity has been prepared and arranged in accordance with Commission Order No. G-133-99 and is presented in sections as follows:

Section A - Applicant
Section B - Project Description
Section C - Project Justification
Section D - Public Consultation
Section E - Other Applications and Approvals

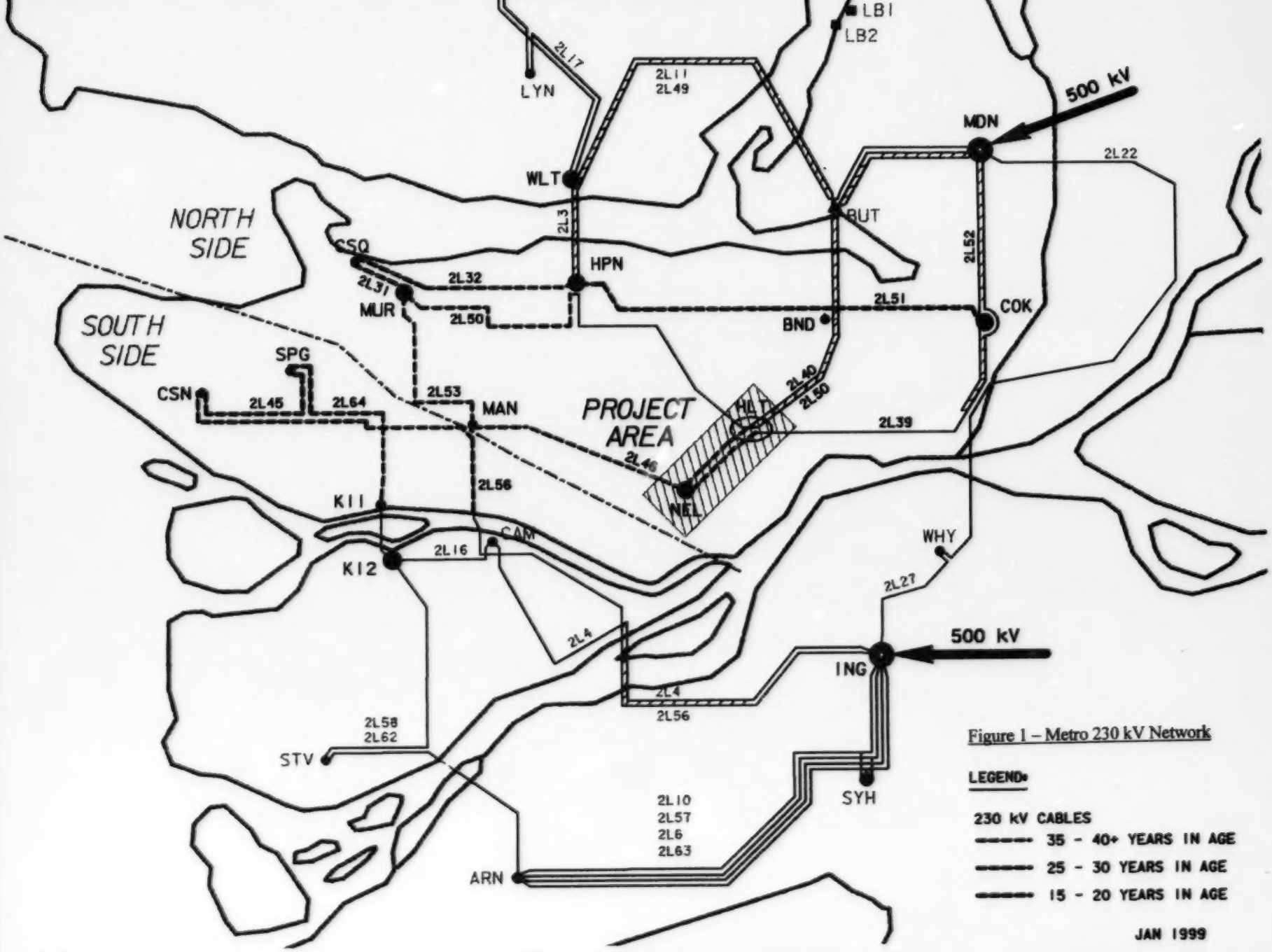


Figure 1 – Metro 230 kV Network

LEGEND:

230 kV CABLES

- 35 - 40+ YEARS IN AGE
- 25 - 30 YEARS IN AGE
- 15 - 20 YEARS IN AGE

JAN 1999

B.C. Hydro has carried out detailed environmental and technical assessments, as well as a proactive public consultation program in connection with this project. This information is summarized in the following supporting documents, which accompany and form part of this application:

1. Circuit 2L39 and 2L40 Underground Cable Replacement between Hill Avenue Terminal Station and Newell Substation, Technical Report, B.C. Hydro, March 2000.

2. Circuit 2L39 and 2L40 Underground Cable Replacement between Hill Avenue Terminal Station and Newell Substation, Environmental Planning and Assessment Report, B.C. Hydro, March 2000.

3. Circuit 2L39 and 2L40 Underground Cable Replacement between Hill Avenue Terminal Station and Newell Substation, Public Consultation Report, B.C. Hydro, March 2000.

TRANSMISSION LINES REFERENCED

B.C. Hydro Circuit Number	DESCRIPTION OF TRANSMISSION LINE AND/OR CABLE CIRCUIT
2L39	Existing single circuit 230 kV transmission line and cable, Meridian Substation to Newell.
2L40	Existing single circuit 230 kV transmission line and cable, Burrard Thermal Generating Station (GS) to Newell Substation.
2L46	Existing single circuit 230 kV transmission cable, Newell Substation to Mainwaring Substation.
60L35	Existing single circuit 69 kV transmission line, Newell Substation to Barnard Substation.
60L36	Existing single circuit 69 kV transmission line, Newell Substation to Meridian Substation.
60L60	Existing single circuit 69 kV transmission line and cable, Newell Substation to New Westminster Substation.
60L67	Existing single circuit 69 kV transmission line and cable, Newell Substation to Royal No. 2 Substation.

SECTION A - APPLICANT

A.1 NAME, ADDRESS AND NATURE OF BUSINESS

British Columbia Hydro and Power Authority ("B.C. Hydro") is a Crown Corporation established in 1962 under the British Columbia Hydro and Power Authority Act. The Corporation is regulated under the Utilities Commission Act. The principal business of B.C. Hydro is the generation, transmission and distribution of electricity.

B.C. Hydro has a head office located at 333 Dunsmuir Street, Vancouver, British Columbia, Canada, V6B 5R3.

A.2 FINANCIAL AND TECHNICAL CAPACITY OF THE APPLICANT

A.2.1 Financial Capacity

B.C. Hydro is an agent of Her Majesty the Queen in right of the Province. The Minister of Finance and Corporate Relations is the fiscal agent of B.C. Hydro, and B.C. Hydro may borrow money only with the approval of the Lieutenant Governor in Council, and then only up to amounts authorized by the Legislature.

B.C. Hydro has constructed some of the largest projects in the province undertaken by a single corporation and has the financial capacity to undertake them by means of borrowing guaranteed by the Province, of borrowing directly from the Province and by funds generated internally from the operation of its business.

Moody's Investors Service and Standard & Poor's Corporation, two major financial rating agencies in the United States, have rated B.C. Hydro bonds as Aa2 and AA-, respectively. The ratings from the Canadian and Dominion Bond Rating Services in Canada are at AA- and AA (low), respectively.

A.2.2 Technical Capacity

B.C. Hydro has been responsible for the planning, design and construction of generation, transmission and distribution facilities since 1962. Consultants with special expertise in engineering, environmental and public consultation matters are retained by B.C. Hydro, from time to time, to advise on various aspects of projects as required.

B.C. Hydro is one of the leaders in North America for the planning, design and construction of substations and high voltage transmission lines. B.C. Hydro has designed, constructed and currently operates approximately 18,800 kilometres of transmission lines within the Province.

A.3 NAME, TITLE AND ADDRESS OF PERSONS TO CONTACT WITH RESPECT TO THIS APPLICATION

Mr. V. (Vince) Masek
Project Manager
B.C. Hydro
6911 Southpoint Drive, Podium B03
Burnaby B.C.
V3N-4X8
Telephone No. (604) 528-2874
Fax No. (604) 528-2037

Or

Ms. S. (Sandra) Jones
Manager, Regulatory Affairs
B.C. Hydro
333 Dunsmuir Street, 17th Floor
Vancouver, B.C.
V6B 5R3
Telephone No. (604) 623-4315
Fax No. (604) 623-4407

A.4 NAME AND ADDRESS OF LEGAL COUNSEL

Mr. R. (Ray) Aldeguer
Senior Vice-President, Legal, Regulatory Affairs and General Counsel
B.C. Hydro
333 Dunsmuir Street, 17th Floor
Vancouver, B.C.
V6B 5R3
Telephone No. (604) 623-4513
Fax No. (604) 623-4323

SECTION B - PROJECT DESCRIPTION

B.1 DESCRIPTION OF THE PROJECT, ITS PURPOSE AND COST

B.1.1 Technical Details

B.1.1.1 Existing System

Newell Substation, which is located in Burnaby, is presently connected to the B.C. Hydro transmission grid by three 230 kV and four 69 kV transmission circuits. Figure 2 depicts B.C. Hydro's Metro Division Electrical System. Electric load demand in South Burnaby, New Westminster and part of South Vancouver is supplied in the following manner:

- From Newell Substation at 12 kV. There are 3-230/12 kV transformers and 32-12 kV distribution feeder circuits; the recorded peak demand in 1998 was 167 MVA.
- From Newell Substation at 69 kV. There are 2-230/69 kV transformers and 4-69 kV circuits, known as 60L35, 60L36, 60L60 and 60L67. The Newell 69 kV system connects to the Coquitlam 69 kV system and supplies Royal and New Westminster Substations (these substations step down the voltage from 69 kV to 12 kV before serving the local load) and Scott Paper. The 69 kV load demand in 1998 was 114 MVA.

The 230 kV circuits are known as 2L39, 2L40 and 2L46. Circuits 2L39 and 2L40 are the main supply lines to Newell Substation and are connected by way of Hill Avenue Terminal Station, located north of the Trans Canada Highway near Burnaby Lake, to Meridian Substation in Coquitlam, and Burrard Thermal Generating Station (GS) in Port Moody. The details of the 3-230 kV circuits connected to Newell Substation are as follows:

- 2L39 - Meridian Substation to Newell Substation, consisting of 11.4 km of overhead line and 3.3 km of underground cables.
- 2L40 - Burrard Thermal Station to Newell Substation, consisting of 9.1 km of overhead line and 3.3 km of underground cables.
- 2L46 - Newell Substation to Mainwaring Substation, consisting of 9.5 km of underground cables.

Power normally flows from Meridian Substation and Burrard Thermal Generating Station to Newell Substation, through Circuits 2L39 and 2L40 respectively, to supply the area load demand (a total of 281 MVA in 1998), and from Newell Substation through Circuit 2L46 to support Mainwaring Substation (about 176 MVA in 1998). The load forecast for South Burnaby, New Westminster and part of South Vancouver is shown in Figure 3.

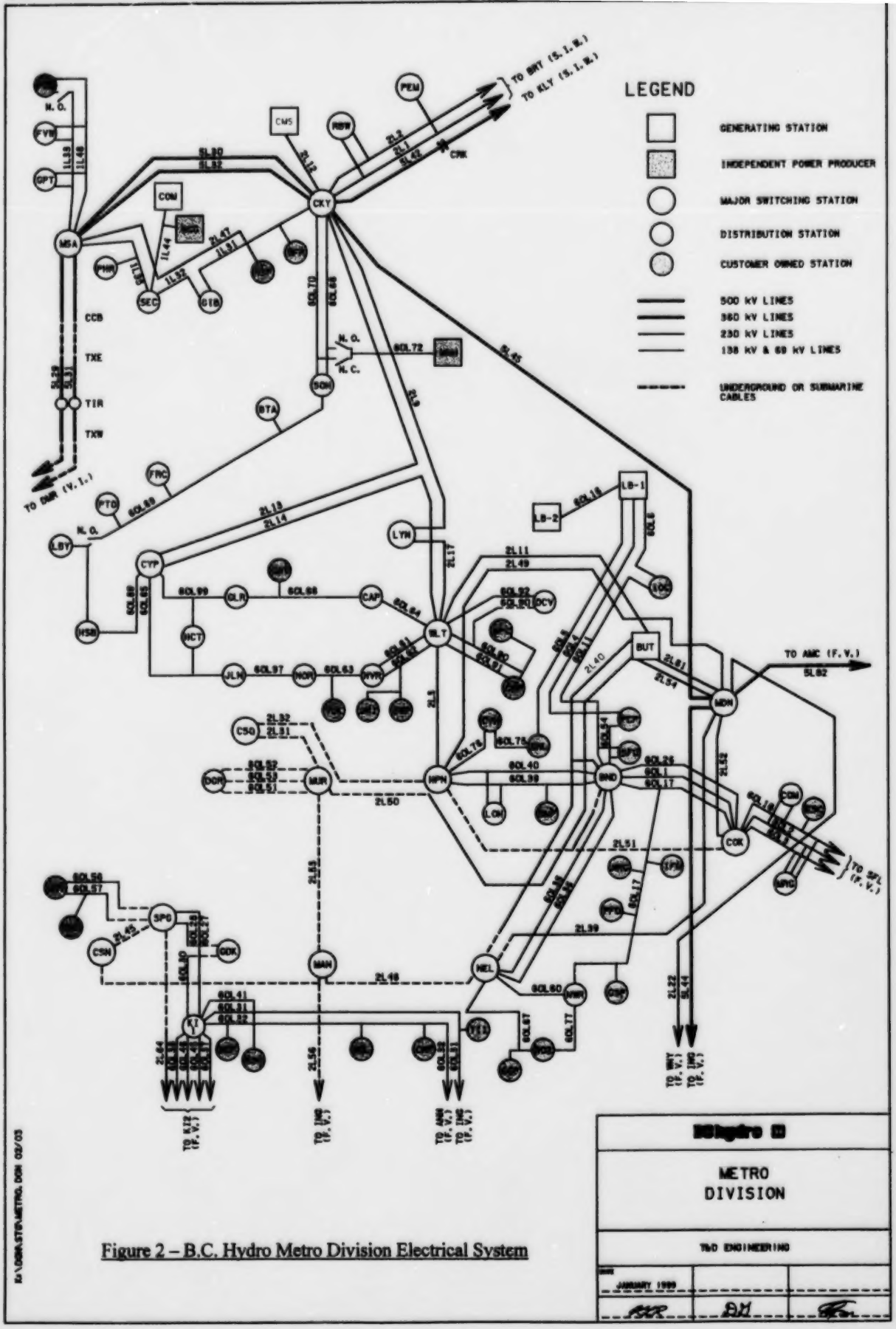
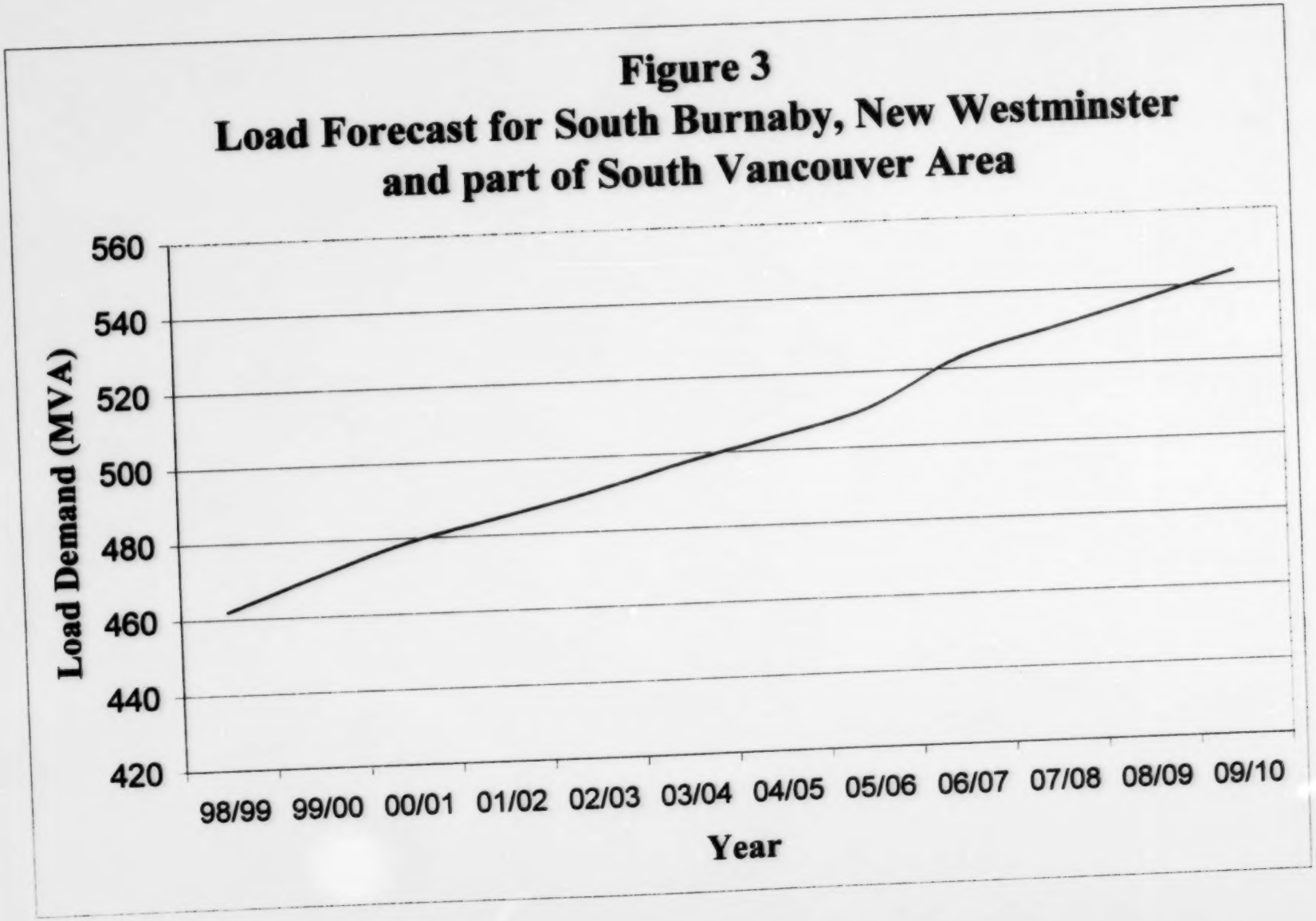


Figure 2 – B.C. Hydro Metro Division Electrical System

Figure 3

Load Forecast for South Burnaby, New Westminster and part of South Vancouver Area



Self-contained oil-filled (SCOF) cables are used for a section of Circuits 2L39 and 2L40 between Newell Substation and the Hill Avenue Terminal Station, a distance of approximately 3.3 kilometres for each circuit. The remainder of Circuits 2L39 and 2L40 is comprised of overhead wood-pole and lattice steel tower transmission lines.

The 2L39 and 2L40 cable circuits are located mainly within a 24.4 metre (80') wide right-of-way corridor located between Newell Substation, located at Kingsway and Griffiths Avenue, Burnaby, and the Hill Avenue Terminal Station, located between the Trans Canada Highway and Burnaby Lake.

B.1.1.2 Description of the Hill Avenue Terminal Station Site

The existing Hill Avenue Terminal Station is located adjacent to the Trans Canada Highway at the southeast end of Burnaby Lake. The station is sited on poorly drained wetland peat and silt/clay soils, and is considered to be seismically unstable.

In consultation with the City of Burnaby, the GVRD, the Ministry of Transportation and Highways (MOTH) and the Ministry of Environment, Lands and Parks (MOELP), a new site, with the least impact on the environment, on Burnaby Lake Park users and on the viewscape, was selected for the terminal station. The preferred configuration comprises relocating the existing terminals closer together for a reduced overall footprint, leaving a larger portion of the area between the Trans Canada Highway and Burnaby Lake essentially unencumbered.

B.1.1.3 Cable Replacement

To facilitate the replacement of the underground cable sections of Circuits 2L39 and 2L40 the existing two ductbank systems will be utilized for the new cables with the exception of a new section crossing under the Trans Canada Highway, which will be installed by horizontal directional drilling.

Following the removal of the old cables, the condition of the existing ducts will be examined, and necessary repairs made. The level and extent of the repairs required will depend on the type and diameter of the cable supplied.

The new cable will be either self-contained oil-filled (SCOF) cable with polypropylene laminated paper insulation (PPLP) or a SCOF cable with a Kraft paper insulation. The selection of the cable type will be based on life-cycle costing including: maximum capacity, cost of losses, ease of installation, reliability, ease of maintenance and repair, and initial cost. A set of oil stop joints, oil reservoirs and oil containment facilities will be installed for each circuit.

B 1.1.4 Substation and Terminal Station

The following work will be undertaken at Newell Substation and the Hill Avenue Terminal Station:

Newell Substation

- Installation of new terminations, supporting structures and foundations.
- Installation of new oil supply system and containment facilities.
- Removal of existing terminations, supporting structures and foundations.
- Removal of existing oil supply system

Hill Avenue Terminal Station

- Upgrading of site access.
- Seismic ground improvement of the new terminal station site.
- Installation of new ducts under the Trans Canada Highway, by horizontal directional drilling.
- Installation of new terminal station including new terminations, supporting structures and foundations.
- Rearrangement of overhead transmission line connections.
- Installation of new oil containment facilities.
- Removal of existing terminal stations including terminations, supporting structures and foundations.

The technical details are provided in more detail in the supporting document titled "Circuit 2L39 and 2L40 Underground Cable Replacement between Hill Avenue Terminal Station and Newell Substation, Technical Report", B.C. Hydro, March 2000.

B.1.2 Purpose of the Project

The purpose of this project is to undertake a staged replacement of the Circuit 2L39 and 2L40 transmission cables, and to relocate the Hill Avenue Terminal Station, to ensure a long-term reliable supply of electricity to B.C. Hydro's customers, located in South Burnaby, New Westminster and part of South Vancouver.

B.1.3 Project Cost

The current forecast cost of the project including inflation, corporate overhead and interest during construction is $29.8 million. The forecast is broken down as shown below:

Table A – Project Costs

Project Component	Forecast Costs ($000s)
Project Definition Phase, including Hill Avenue Site Selection and CPCN Application:	$300
Engineering, Management, Properties, Environmental and Public Consultation:	$2,400
Construction/Materials:	
▸ Cable Supply / Install Contract	19,500
▸ Other Construction and Materials	$3,200
Total Direct Un-inflated Cost (including contingencies):	*$25,400*
Inflation:	$600
Corporate Overhead:	$3,200
Interest During Construction:	$600
Total Forecast Cost:	*$29,800*

B.2 TIMETABLE

Due to system operating constraints and the availability of outages, the construction is to be staged over two years. The first stage, comprising the construction of the new Hill Avenue Terminal Station, for both circuits, and the replacement of Circuit 2L39 is scheduled for completion by Fall 2001. Once Circuit 2L39 is re-energized, the replacement of Circuit 2L40 would commence with a scheduled completion date of Fall 2002. Figure 4 shows the key activities associated with the project.

B.3 PUBLIC WORKS

There are no new public works required for this project.

B.4 IDENTIFICATION AND PRELIMINARY ASSESSMENT OF IMPACTS

B.4.1 Social and Environmental Issues

Initial studies and consultation with stakeholder groups have identified potential social and biophysical impacts of this project. The most significant impact will be the short-term inconvenience to the public, primarily as a result of the disruption of recreational activities in the area of the Hill Avenue Terminal Station. These impacts will be associated with the construction of the new terminal station as well as the upgrading of the existing access into the site. The existing jogging/horseback-riding trail will require re-routing as it currently passes through the proposed area for the new terminal station. As well, a portion of the trail, located west of the station, will be closed during construction activities to ensure public safety.

In addition, there will be some inconveniences (primarily noise and construction traffic) to property owners along the right-of-way between the Hill Avenue Terminal Station and Newell Substation arising from the removal of the old cables, duct repairs and the installation of the new cables. Removal of the cable may require excavation at the existing manholes and some manholes will have to be modified to suit the new cables.

Short-term impacts to the biophysical environment will result from the temporary diversion of creeks during the upgrading of the existing access road to the Hill Avenue Terminal Station site. This temporary diversion will be necessary in order to install larger culverts and reduce sedimentation downstream. Preliminary discussions have been held with both MOELP and the Department of Fisheries and Oceans (DFO) in this regard. Approval of the culvert design together with the necessary permit applications will be obtained from both DFO and MOELP.

ID	Task Description
1	**Hill Avenue Terminal Station and Access Assessment**
2	**Initial Consultation**
3	**Project Plan and Business Case**
4	**BC Hydro Board Approval**
5	**Preliminary Design**
6	**CPCN Application**
7	**Public Consultation**
8	**BCUC Review**
9	**BCUC Order Issued**
10	**Cable Supply/Install Contract**
11	Tender Call
12	Tender Close
13	Tender Award
14	**Stage 1-Circuit 2L39 & Hill Avenue Terminal Station**
15	Hill Avenue Terminal Station Access Construction
16	Cable Manufacture and Delivery
17	Installation
18	Circuit 2L39 Re-Energized
19	**Stage 2-Circuit 2L40**
20	Cable Manufacture and Delivery
21	Installation
22	Circuit 2L40 Re-Energized

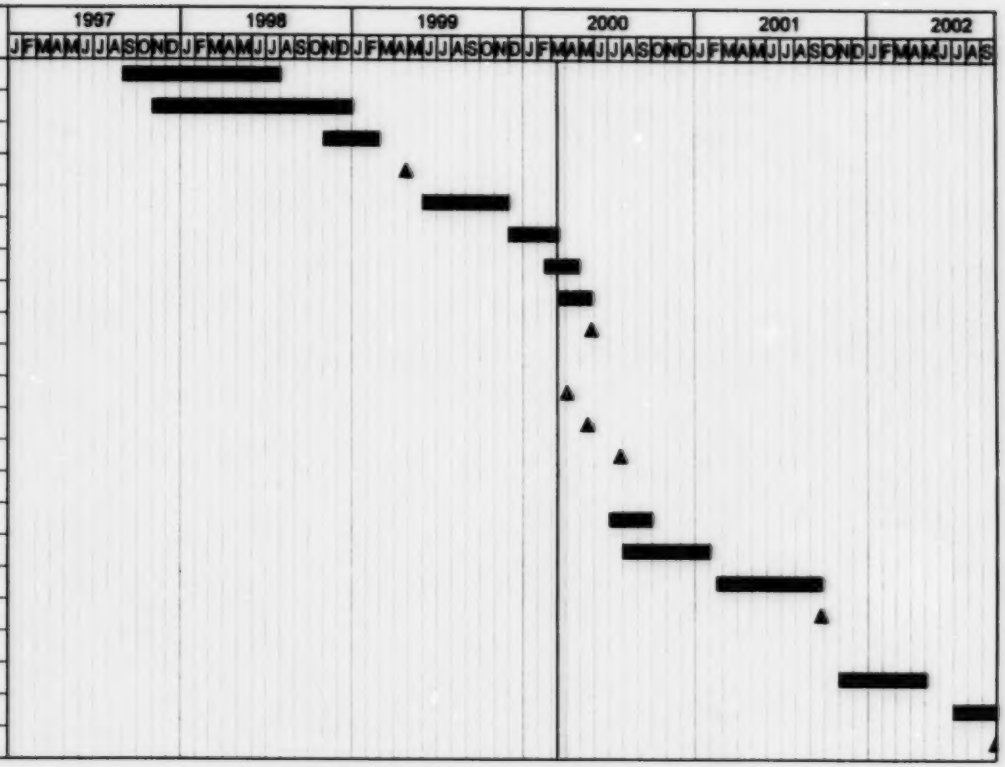


Figure 4 - Project Schedule

Prior to the commencement of construction, B.C. Hydro will prepare final environmental and construction management plans to ensure that all environmental concerns have been addressed. Every effort will be made to minimize construction impacts and disruptions to the community and recreational users of Burnaby Lake Park while this work is in progress. An environmental inspector will be employed on site for the duration of the construction period.

There will be little or no impact on existing land use and heritage resources.

B.4.2 Proposed Mitigation Measures

In general, selection of the site for the new Hill Avenue Terminal Station represents mitigation of a large number of potential social and biophysical impacts that could result from the project. The preferred site represents the least impact option, and by consensus of the agency stakeholders is preferred for that reason. However, there will be some short-term temporary impacts, as noted above, that will be mitigated as outlined below.

The jogging /riding trails through the Hill Avenue Terminal Station construction area will be re-routed and apart from the activity associated with construction sites, should not present any further inconvenience to the trail users. To the west, along the right-of-way, access will be restricted, for safety reasons, during construction of the new terminal station and the access road. While joggers will still be able to use the lower trails along the lake, horseback riders will be restricted to evenings and weekend use only during the construction period. Regular communication and work schedules will be shared with the Burnaby Lake Horseman's Association to minimize periods of unavailability.

Upgrading of the culverts at the creek crossings will require the temporary de-watering of the creeks so that the culverts can be installed in dry conditions. While this may present some short-term impacts to the creek ecology, it will also prevent longer-term impacts by preventing the sedimentation and disturbance that would come from construction. As well, the upgraded culverts will be designed to provide long-term improvements to the creek ecology by enhancing fish passage, where necessary, realigning the culverts to prevent scour, and increasing creek habitat by imbedding the culverts and providing flow-stilling structures in the creek bed inside the culverts.

Construction disturbances within the neighbourhoods associated with the removal and installation of the underground cable cannot be completely mitigated. However, B.C. Hydro will work with the public to ensure that disturbance's in the neighbourhoods are minimized.

Details of the environmental impact assessment are provided in the supporting document titled "Circuit 2L39 and 2L40 Underground Cable Replacement between Hill Avenue Terminal Station and Newell Substation, Environmental Planning Assessment", B.C. Hydro, March 2000.

SECTION C - PROJECT JUSTIFICATION

As indicated on the attached "Metro 230 kV Network Diagram", attached as Figure 1, the Metropolitan Vancouver area is supplied by twelve-230 kV underground transmission cable circuits. Some of the older cables, installed in late 1950's, including circuits 2L39 and 2L40, have exceeded their design life and have deteriorated to the extent that replacement is necessary. These two circuits, including Circuits 2L46 and 2L53 are known as the South Burnaby Transmission System (SBTS) that forms the southern path linking Meridian Substation and Burrard Thermal Generating Station (GS) to the downtown Vancouver area. This system provides power to South Burnaby, New Westminster and part of South Vancouver. During outages the SBTS also provides reinforcement to the downtown Vancouver substations.

The metal sheath of Circuits 2L39, 2L40 and 2L46 cables is severely deteriorated and their condition is rated as "very poor" based on their maintenance record and operational experience. The need to take these circuits out for maintenance and repair, due to the oil leaks (which are contained within the existing ducts), has increased significantly in the past few years, and is expected to accelerate as the conditions of the cables continue to deteriorate. Since circuits 2L39 and 2L40 are heavily loaded, the frequency and the duration of these circuits being unavailable for service increases the risk of overloading the 230 kV system, and may result in load shedding, due to high loads. With circuits 2L39, 2L40 and 2L46 being the only 230 kV supply source to Newell Substation, there is a risk of cascading failure of all three circuits and isolation of Newell Substation from the system.

The deterioration of the cables also present a high potential for oil leaks creating a significant environmental hazard, especially in the vicinity of the Hill Avenue Terminal Station, where Circuits 2L39 and 2L40 change from overhead lines to underground cables. As the existing oil containment facilities are inadequate, an uncontained oil leak could result in an oil spill and contamination of Robert Burnaby Creek, Burnaby Lake and the adjacent wetlands.

The Hill Avenue Terminal Station and the associated ducts which cross under the Trans Canada Highway, are located in a soft swampy soil with minimal resistance to earthquakes. There is a high probability that these facilities would collapse in a moderate earthquake and damage the terminations and cables. The consequences of these facilities collapsing would result in extended outages and excessive oil spills. If the damaged cables are not isolated quickly, they could be contaminated beyond repair and would require complete replacement. Also, a prolonged oil spill would cause environmental damage to Burnaby Lake. The cost and time required to restore service would depend on the extent of damage, availability of spare materials, resources and access to site during post earthquake conditions.

In order to meet the latest B.C. Hydro Seismic Performance Criteria for new construction, several alternative sites were considered for the new Hill Avenue Terminal Station. A new site, located immediately east of the existing terminal of Circuit 2L39, has been selected after consultation with key stakeholders (City of Burnaby, Ministry of Transportation and Highways (MOTH), Greater Vancouver Regional District (GVRD), and Ministry of Environment, Lands and Parks (MOELP).

In summary, maintaining the status quo is not acceptable. The continued operation of the deteriorated cable circuits 2L39 and 2L40, which are both heavily loaded, is a risk to the reliability of the supply of electricity to B.C. Hydro's customers, located in the South Burnaby Transmission System supply area. Installation of new cables will address additional capacity requirements for future load growth, the high annual maintenance cost of repairing the existing cables, and potential environmental hazards due to oil leaks.

The new cables will have a projected life of at least 40 years, and will be sized to meet the forecasted 1.4% annual load growth in South Burnaby, New Westminster and part of South Vancouver.

Extended outages will be required during the construction period; however, it is not expected that there would be any disruption of service to B.C. Hydro's customers, and therefore no revenue loss attributed to this project.

Based on B.C. Hydro's technical assessment it is recommended to relocate the Hill Avenue Cable Terminal Station to a seismically stable area, and to undertake the staged replacement of both the 2L39 and 2L40 cable circuits with higher capacity cables, adequate to supply the immediate, as well as the long-term load demand. The project received approval of B.C. Hydro's Board of Directors on 26 April 1999.

SECTION D - PUBLIC CONSULTATION

As part of the project, a proactive public consultation program was undertaken. The goal of this program was to incorporate public and community values into B.C. Hydro's decision-making process.

Initial consultation began in the fall of 1997, and input was obtained from the City of Burnaby, the Greater Vancouver Regional District (GVRD), Ministry of Environment, Lands and Parks (MOELP), Ministry of Transportation and Highways (MOTH), and the Department of Fisheries and Oceans Canada (DFO).

Broader public input was obtained in the summer of 1998 to update the general public and confirm that the agencies or municipal governments representing them had adequately reflected their views. An information advertisement was placed in the "Burnaby Now", a local newspaper, and an Open House was held at the Bill Copeland Recreation Centre on July 27th, 1998, however public response was very low.

Key groups impacted by the construction of the project are those residents located along the right-of-way, and the recreational users of the Burnaby Lake Park. Preliminary information on the project was provided to the users of the park through the GVRD, at the Burnaby Lake Task Force Meeting held in February 1998. Key issues identified were minimizing environmental, aesthetic and recreational impacts. Based on the feedback received from the stakeholders, a preferred location was identified for the new Hill Avenue Terminal Station.

Further communication and consultation comprising of additional project advertising, meetings with affected and impacted groups and individuals and, if necessary, an additional Open House is planned for Spring 2000.

At this time, B.C. Hydro is not aware of any issues that cannot be resolved or mitigated. Further issues will be addressed prior to the commencement of construction. Communication updates will continue to be provided directly to those groups with specific interests, and more generally through press releases, letters to residents, project newsletters, and site specific signage. Contact telephone numbers will be provided on all material so any new issues that may emerge can be resolved quickly.

Details of the public consultation program are provided in the supporting document titled "Circuit 2L39 and 2L40 Underground Cable Replacement between Hill Avenue Terminal Station and Newell Substation, Public Consultation Report", B.C. Hydro, March 2000.

SECTION E - OTHER APPLICATIONS AND APPROVALS

City of Burnaby approval will be obtained for an additional easement through Robert Burnaby Park for the new ducts to be installed under the Trans Canada Highway.

In addition, B.C. Hydro and its contractors will apply for any and all ancillary permits, licenses and approvals as required by law for the construction and operation of the proposed transmission line. Such permits are not being pursued, as part of this Application, but will be obtained upon approval.

The following applications may be required in connection with the proposed project:

- Approvals under the Heritage Conservation Act.
- Approvals under the B.C. Heritage Conservation Statutes Amendment Act.
- Approvals under the Fisheries Act (Canada).
- Approvals under the Water Act.
- Approvals under the Waste Management Amendment Act.
- Miscellaneous approvals, permits and licenses routinely required from time to time for construction work, including Ministry of Transportation and Highways for crossing the Trans Canada Highway and approval of temporary road closures.

GLOSSARY

Biophysical	–	Science of the application of the laws of physics to living organisms.
Direct Dollars	–	Project related costs excluding overhead charges and Interest During Construction (IDC).
Ecology	–	Study of organisms in relation to one another and to their surroundings.
Ecosystem	–	Biological community of interacting organisms and their physical environment.
EMF	–	Electric and Magnetic Fields, invisible lines of force that surround all electrical wires.
Flow-stilling	–	The creation of rest areas for fish (swimming against the current) within extended sections of fast flowing water. In longer culverts, which can represent long reaches of constant current, this is done using rocks or built in baffles.
Heritage Resources	–	Historic buildings, monuments, countryside.
Integrated System	–	All distribution and transmission areas served by B.C. Hydro.
KV	–	A kilovolt is equivalent to one thousand volts; i.e. 500 kV is 500,000 volts.
Load	–	The amount of electricity required by a customer or group of customers as measured by an electrical meter.
Load Shedding	–	A pre-selected alternative to reduce electrical demand on the distribution or transmission system to bring the demand within the acceptable equipment capabilities.
Losses	–	Reductions in the amount of electricity actually reaching an end customer as a result of heat generated by resistance in transmission or distribution lines.
MVA	–	A Megavolt-Amperes is equivalent to one million amperes.
MW	–	A Megawatt is equivalent of one million watts. A watt is the unit for measuring electrical power or the rate of generating, transmitting or consuming electricity.
Peak Demand	–	The highest level of electricity needed in a given period of time.
PPLP	–	Polypropylene laminated paper insulation.
Reinforcement	–	Improvements in the electrical system to maintain or improve reliability and security of supply.
Reliability	–	A measure of the continuity and quality of electric service. Reliability of service to an individual customer depends on the reliability of both the high-voltage transmission and the low-voltage distribution system.

GLOSSARY (cont'd)

Right-of-Way	–	The land rights acquired by a utility to allow construction and operation of electrical transmission or distribution facilities.
SCOF	–	Self contained oil filled cable
Scour	–	To flow through or over.
Single Circuit	–	A transmission line carrying only one independent circuit on the respective structure.
Terminal Station	–	Facility, not a substation, where cables and/or overhead conductors are terminated for transition to an overhead and/or underground system.
Termination	–	Cable termination for connection to an overhead system.
XLPE	–	Cross-linked polyethylene cable.

REFERENCES

1. Circuit 2L39 and 2L40 Underground Cable Replacement between Hill Avenue Terminal Station and Newell Substation, Technical Report, B.C. Hydro, March 2000.

2. Circuit 2L39 and 2L40 Underground Cable Replacement between Hill Avenue Terminal Station and Newell Substation, Environmental Planning and Assessment Report, B.C. Hydro, March 2000.

3. Circuit 2L39 and 2L40 Underground Cable Replacement between Hill Avenue Terminal Station and Newell Substation, Public Consultation Report, B.C. Hydro, March 2000.